

[0058] What is claimed as new and desired to be protected by Letters

Patent is set forth in the appended claims:

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CLAIMS

What is claimed is:

1. An electric machine, comprising:
 - a shaft;
 - a rotor;
 - means for excitation of at least portions of the rotor;
 - means for torque pickup upon the rotor;
 - means for force transfer between the rotor and the shaft; and
 - a web structure between the means for torque pickup and the means for force transfer while effecting an inertial mass relief of the rotor.
2. The electric machine of claim 1, wherein the web structure has at least one web configured as secant.
3. The electric machine of claim 1, wherein the web structure has at least one web configured as arc.
4. The electric machine of claim 1, wherein the means for excitation includes at least one winding of an electric conductor.
5. The electric machine of claim 1, wherein the means for torque pickup includes at least one slot for receiving at least one winding.

6. The electric machine of claim 1 in the form of a permanently excited synchronous machine.
7. The electric machine of claim 6, wherein the means for excitation includes at least one permanent magnet.
8. The electric machine of claim 7, wherein the means for torque pickup contacts at least partially the at least one permanent magnet.
9. The electric machine of claim 1, wherein the means for force transfer between the rotor and the shaft includes at least one connection selected from the group consisting of positive engagement, non-positive engagement, and material-based joint.
10. The electric machine of claim 1, wherein the web structure is configured to have a honeycomb pattern.
11. The electric machine of claim 10, wherein the honeycomb pattern of the web structure is formed by a foam.
12. The electric machine of claim 10, wherein the honeycomb pattern of the web structure is made rigid.

13. The electric machine of claim 10, wherein the honeycomb pattern of the web structure is made flexible.
14. The electric machine of claim 1, wherein the rotor is assembled from several parts.
15. The electric machine of claim 1, wherein the rotor is made of at least two materials.
16. An electric machine, comprising:
 - a rotor;
 - a shaft centered interiorly of the rotor;
 - an excitation structure for generating a torque;
 - a torque receiving structure for picking up the torque from the excitation structure and imparting the torque onto the rotor; and
 - a connection structure for providing a fixed rotative engagement between the rotor and the shaft;wherein the rotor includes a web structure extending inwardly from the torque receiving structure to the shaft and effecting an inertial mass relief of the rotor.
17. The electric machine of claim 16, wherein the web structure has at least one web configured as secant.

18. The electric machine of claim 16, wherein the web structure has at least one web configured as arc.
19. The electric machine of claim 16, wherein the excitation structure includes at least one winding of an electric conductor.
20. The electric machine of claim 16, wherein the torque receiving structure includes at least one slot for receiving at least one winding.
21. The electric machine of claim 16, wherein the excitation structure includes at least one permanent magnet disposed in a slot of the torque receiving structure contacts at least partially the at least one permanent magnet.
22. The electric machine of claim 16, wherein the connection structure includes at least one connection selected from the group consisting of positive engagement, non-positive engagement, and material-based joint.
23. The electric machine of claim 16, wherein the web structure is configured to have a honeycomb pattern.
24. The electric machine of claim 23, wherein the honeycomb pattern of the web structure is formed by a foam.

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25. The electric machine of claim 23, wherein the honeycomb pattern of the web structure is made rigid.
26. The electric machine of claim 23, wherein the honeycomb pattern of the web structure is made flexible.
27. The electric machine of claim 16, wherein the rotor is assembled from several parts.
28. The electric machine of claim 16, wherein the rotor is made of at least two materials.
29. The electric machine of claim 16, wherein the web structure includes a polygonal ring embracing the shaft and a plurality of webs extending between the torque receiving structure and the polygonal ring.
30. The electric machine of claim 22, wherein the positive engagement includes a fitting key assembly, including a key received in aligned grooves of the web structure and the shaft.
31. The electric machine of claim 22, wherein the non-positive engagement includes shrinking of the rotor onto the shaft.

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32. The electric machine of claim 22, wherein the material-based joint includes a process selected from the group consisting of gluing and welding for connecting the rotor to the shaft.
33. A rotor adapted for use in an electric machine, comprising:
 - a body portion having an outer annulus and a web structure configured to effect an inertial mass relief of the main body, wherein the web structure extends inwardly from the annulus and forms a bore for receiving a shaft; and
 - an excitation structure operatively connected to the annulus for imparting a torque on the body portion.
34. The rotor of claim 33, wherein the web structure includes a plurality of webs so crisscrossing the body portion as to define a plurality of relief zones.
35. The rotor of claim 34, wherein the webs are arcuate.
36. The rotor of claim 33, wherein the excitation structure includes an element connected to the annulus and selected from the group consisting of permanent magnet and an electric conductor.
37. The rotor of claim 34, wherein the webs exhibit a honeycomb pattern.

38. The rotor of claim 37, wherein the honeycomb pattern of the web structure is formed by a foam.

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